



DNTLC01 DEVICENET SPECIFICATIONS

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Revision History

Revision	Description of changes	Date
1.1	Initial Release	2007/03/06

DNTLC01 Overview

The DNTLC01 module provides an interface between a load cell DeviceNet and and a

A Weigh Scale Object (Class 100) allows the master to control the load cell ports and receive the status of the load cell interface.

A Weigh Scale Port Object (Class 101) allows the user to configure and monitor the attached load cell(s).

Firmware

The DNTLC01 supports DeviceNet using. The unit operates as a Group2 only or a UCMM capable device. Additional objects include a User Defined configuration object

Leds

The DNTLC01 supports the following LEDs

LED	Colors	Meaning	State	Description of LED State
NT	Red/Green	DeviceNet Network Status		See ODVA Specs
MD	Red/Green	Module Status		See ODVA Specs
PORT 1 (Primary)	Red/Green	Load Cell Status	Off	No Power
			Red/Green Flash	Self Test
			Green Flash	A/D has read new data
			Red	No Reference voltage (Check Sense Connection)
PORT 1 (Secondary)	Red/Green	Load Cell Status	Off	No Power
			Red/Green Flash	Self Test
			Green Flash	A/D has read new data
			Red	No Reference voltage (Check Sense Connection)
PORT 2 (Primary)	Red/Green	Load Cell Status	Off	A/D has read new data
			Red/Green Flash	Self Test
			No Power	Red
			Green Flash	No Reference voltage (Check Sense Connection)
PORT 2 (Secondary)	Red/Green	Load Cell Status	Off	No Power
			Red/Green Flash	Self Test
			Green Flash	A/D has read new data
			Red	No Reference voltage (Check Sense Connection)

DeviceNet Message Types

The DNTLC01 supports the Group 4 Offline Connection set.

CAN IDENTIFIER	GROUP 2 Message Type
11111101100	Communication Faulted Response Message
11111101101	Communication Faulted Request Message
11111101110	Communication Ownership Response Message
11111101111	Communication Ownership Request Message

DeviceNet Class Services

The DNTLC01 supports the following class services and instance services.

SERVICE CODE	SERVICE NAME
05 (0x05)	Reset
14 (0x0E)	Get Attribute Single
16 (0x10)	Set Attribute Single

DeviceNet Object Classes

The DNTLC01 device supports the following DeviceNet object classes.

CLASS CODE	OBJECT TYPE
01 (0x01)	Identity
02 (0x02)	Router
03 (0x03)	DeviceNet
04 (0x04)	Assembly
05 (0x05)	Connection
43 (0x2D)	Acknowledge Handler
100 (0x64)	Weigh Scale Object
101 (0x65)	Weigh Scale Port Object

Identity Object

Class Code: 01 (0x01)

The Identity Object is required on all devices and provides identification of and general information about the device.

Identity Object Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
2	Get	Max Object Instance	UINT	1
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	10

Identity Object Instance Attributes

Attribute	Access	Name	Type	Value
1	Get	Vendor	UINT	724
2	Get	Product Type	UINT	0 = Generic Device
3	Get	Product Code	UINT	2000
4	Get	Revision	STRUCT OF	
		Major Revision	USINT	1
		Minor Revision	USINT	1
5	Get	Device Status	UINT	
6	Get	Serial Number	UINT	
7	Get	Product Name	STRUCT OF	
		Length	USINT	19
		Name	STRING [6]	DNTLC01
8	Get	State	USINT	
10	Get/Set	Heartbeat Interval	USINT	Heartbeat interval in seconds

Identity Object Common Services

Service Code	Class	Instance	Service Name
05 (0x05)	No	Yes	Reset
14 (0x0E)	Yes	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Identity Object Attributes

Product Code – Attribute 3

The Product code is fixed at 2000 for the DNTLC01. The product code is used within the Electronic Data Sheet format to uniquely identify the product type.

Revision Information – Attribute 4

The major revision number will increment as functional enhancements are implemented. The minor firmware revision control number is incremented if minor changes are incorporated.

Device Status – Attribute 5

Bit Number	Name	Meaning
0	Owned	= 0, not owned = 1, allocated
1	Reserved	
2	Configured	= 0, not configured – this bit is not supported
3	Reserved	
4-7	User defined	
8	Minor Recoverable fault	= 0, no fault = 1, minor recoverable faults (DOP short circuit)
9	Minor Unrecoverable fault	= 0, no fault = 1, minor unrecoverable faults
10	Major Recoverable fault	= 0, no fault = 1, major recoverable faults (Loss of +24 Vdc)
11	Major Unrecoverable fault	= 0, no fault = 1, major unrecoverable faults (Checksum, A/D)
12-15	Reserved	

Serial Number – Attribute 6

The serial number is encoded in the product during the manufacturing cycle.

Device Name – Attribute 7

The Device Name provides a character array containing the short string DNTLC01.

Device State – Attribute 8

The Device State reflects whether any errors have occurred and the severity. The following states are supported. The only exit from a Major Unrecoverable fault condition is power cycling the device.

State	Interpretation	Causes
0	Non-existent	
1	Self Test	
2	Standby	
3	Operating	Normal operating mode
4	Major Recoverable fault	Loss of +24 Vdc power
5	Major Unrecoverable fault	Memory Checksum failure

Router Object

Class Code: 02 (0x02)

The Message Router Object provides a messaging connection point through which a Client may address a service to any object class or instance residing in the physical device.

Router Object Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	4

Router Object, Instance 1 Attributes

Router Object Common Services

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	No	Get Attribute_Single

DeviceNet Object

Class Code: 03 (0x03)

The DeviceNet Object defines how the node interfaces to the DeviceNet system.

DeviceNet Object Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	9

DeviceNet Object, Instance 1 Attributes

Attribute	Access	Name	Type	Value
1	Get/Set	MACID	USINT	(1)
2	Get/Set	Baud Rate	USINT	(2)
3	Get/Set	Bus Off Interrupt	BOOL	(3)
4	Get/Set	Bus Off Counter	USINT	(4)
5	Get/Spc	Allocation Information	STRUCT of	(5)
		Choice Byte	BYTE	
		Master Node Addr.	USINT	
6	Get	MAC ID Switch changed	BOOL	
7	Get	Baud Rate Switch Changed	BOOL	
8	Get	MAC ID Switch Value	USINT	
9	Get	Baud Rate Switch Value	USINT	

DeviceNet Object Common Services

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get Attribute Single
16 (0x10)	No	Yes	Set Attribute Single
75 (0x4B)	No	Yes	Allocate Master/Slave
76 (0x4C)	No	Yes	Release Master/Slave

DeviceNet Object Attributes

MacID – Attribute 1

The MACID is set using two decimal rotary switches. Valid MACID addresses are 0 to 63 (0 to 3F Hex). Setting the switch address to a value greater than 63 will disable the switch and allow software setting of the MACID. The software setting defaults to the last hardware setting. The switch is only read during power up.

Data Rate – Attribute 2

The Data Rate is set using a decimal rotary switch located on the module. Setting the switch to a position greater than 2 disables the switch and allows software setting of the Data Rate. The software setting defaults to the last hardware setting.

Bus Off Interrupt – Attribute 3

Bus Off Interrupt (BOI) determines the action if a Bus Off state is encountered.

BOI	Action
0	Hold chip in OFF state (default)
1	If possible reset CAN chip
2	

Bus Off Counter – Attribute 4

Bus Off Counter will be forced to 0 whenever set regardless of the data value provided.

Allocation Byte – Attribute 5

Allocation_byte	
bit 0	explicit set to 1 to allocate
bit 1	polled set to 1 to allocate
bit 2-7	reserved (always 0)

Assembly Object

Class Code: 04 (0x04)

The Assembly Objects bind attributes of multiple objects to allow data to or from each object to be sent or received over a single connection.

Assembly Object Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
2	Get	Max Class ID	UINT	127
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	3

Assembly Object, Instance 100 Attributes

Attribute	Access	Name	Type	Value
3	Get/Set	Control Data	See Table	See Table

Assembly Object, Instance 101-127 Attributes

Attribute	Access	Name	Type	Value
3	Get/Set	Status/Weight Data	See Table	See Table

Assembly Object Common Services

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

I/O Assembly Instances

Number	Type	Name
100	Output	Control Data
101	Input	Status, Gross CH1 INT16
102	Input	Status, Gross CH1 INT32
103	Input	Status, Gross CH1 REAL32
104	Input	Status, Gross CH1 INT16, Gross CH2 INT16
105	Input	Status, Gross CH1 INT32, Gross CH2 INT32
106	Input	Status, Gross CH1 REAL32, Gross CH2 REAL32
107	Input	Status, Gross CH1 INT16, Gross CH3 INT16
108	Input	Status, Gross CH1 INT32, Gross CH3 INT32
109	Input	Status, Gross CH1 REAL32, Gross CH3 REAL32
110	Input	Status, Gross CH1 INT16, Gross CH2 INT16, Gross CH3 INT16
111	Input	Status, Gross CH1 INT32, Gross CH2 INT32, Gross CH3 INT32
112	Input	Status, Gross CH1 REAL32, Gross CH2 REAL32, Gross CH3 REAL32
113	Input	Status, Gross CH1 INT16, Gross CH2 INT16, Gross CH3 INT16, Gross CH4 INT16

114	Input	Status, Gross CH1 INT32, Gross CH2 INT32, Gross CH3 INT32, Gross CH4 INT32
115	Input	Status, Gross CH1 REAL32, Gross CH2 REAL32, Gross CH3 REAL32, Gross CH4 REAL32
116	Input	Status, Gross CH1 INT16, Tare CH1 INT16, Net CH1 INT16
117	Input	Status, Gross CH1 INT32, Tare CH1 INT32, Net CH1 INT32
118	Input	Status, Gross CH1 REAL32, Tare CH1 REAL32, Net CH1 REAL32
119	Input	Status, Gross CH1 INT16, Tare CH1 INT16, Net CH1 INT16, Gross CH2 INT16, Tare CH2 INT16, Net CH2 INT16
120	Input	Status, Gross CH1 INT32, Tare CH1 INT32, Net CH1 INT32, Gross CH2 INT32, Tare CH2 INT32, Net CH2 INT32
121	Input	Status, Gross CH1 REAL32, Tare CH1 REAL32, Net CH1 REAL32, Gross CH2 REAL32, Tare CH2 REAL32, Net CH2 REAL32
122	Input	Status, Gross CH1 INT16, Tare CH1 INT16, Net CH1 INT16, Gross CH3 INT16, Tare CH3 INT16, Net CH3 INT16
123	Input	Status, Gross CH1 INT32, Tare CH1 INT32, Net CH1 INT32, Gross CH3 INT32, Tare CH3 INT32, Net CH3 INT32
124	Input	Status, Gross CH1 REAL32, Tare CH1 REAL32, Net CH1 REAL32, Gross CH3 REAL32, Tare CH3 REAL32, Net CH3 REAL32
125	Input	Status, Gross CH1 INT16, Tare CH1 INT16, Net CH1 INT16, Gross CH2 INT16, Tare CH2 INT16, Net CH2 INT16, Gross CH3 INT16, Tare CH3 INT16, Net CH3 INT16, Gross CH4 INT16, Tare CH4 INT16, Net CH4 INT16
126	Input	Status, Gross CH1 INT32, Tare CH1 INT32, Net CH1 INT32, Gross CH2 INT32, Tare CH2 INT32, Net CH2 INT32, Gross CH3 INT32, Tare CH3 INT32, Net CH3 INT32, Gross CH4 INT32, Tare CH4 INT32, Net CH4 INT32
127	Input	Status, Gross CH1 REAL32, Tare CH1 REAL32, Net CH1 REAL32, Gross CH2 REAL32, Tare CH2 REAL32, Net CH2 REAL32, Gross CH3 REAL32, Tare CH3 REAL32, Net CH3 REAL32, Gross CH4 REAL32, Tare CH4 REAL32, Net CH4 REAL32

Connection Object

Class Code: 05 (0x05)

The Connection Objects manage the characteristics of each communication connection. As a UCMM capable device the unit supports up to three UCMM explicit connections, up to three Dynamic I/O connections, as well as one master/slave Poll, Strobe and COS/Cyclic connections. Up to 10 connections can be established at one time.

Connection Object Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
2	Get	Max Class ID	UINT	= Max Connection Allocated
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	17

Connection Object, Instance 1 Attributes (Explicit Message)

Attribute	Access	Name	Type	Value
1	Get	State	USINT	(1)
2	Get	Instance Type	USINT	0 = Explicit Message
3	Get	Transport Class Trigger	USINT	0x83
4	Get	Production Connection	UINT	(2)
5	Get	Consumed Connection	UINT	(2)
6	Get	Initial Comm. Char.	USINT	0x21
7	Get	Production Size	UINT	30
8	Get	Consumed Size	UINT	35
9	Get/Set	Expected Packet Rate	UINT	default 2500 msec
12	Get/Set	Timeout Action	USINT	(12)
13	Get	Prod. Path Length	USINT	0
14	Get	Production Path		(null)
15	Get	Cons. Path Length	USINT	0
16	Get	Consumed Path		(null)

Connection Object, Instance 2 Attributes (POLL connection)

Attribute	Access	Name	Type	Value
1	Get	State	USINT	(1)
2	Get	Instance Type	USINT	1 = I/O Message
3	Get	Transport Class Trigger	USINT	0x83
4	Get	Production Connection	UINT	(2)
5	Get	Consumed Connection	UINT	(2)
6	Get	Initial Comm. Char.	USINT	0x1
7	Get	Production Size	UINT	See Assembly Object
8	Get	Consumed Size	UINT	See Assembly Object
9	Get/Set	Expected Packet Rate	UINT	default 2500 msec
12	Get/Set	Timeout Action	USINT	(12)
13	Get	Prod. Path Length	USINT	6
14	Get	Production Path	STRUCT of	
		Log. Seg., Class	USINT	0x20
		Class Number	USINT	0x04
		Log.Seg., Instance	USINT	0x24
		Instance Number	USINT	0x101
		Log.Seg., Attribute	USINT	0x30
		Attribute Number	USINT	0x03
15	Get	Cons. Path Length	USINT	6
16	Get	Consumed Path	STRUCT of	
		Log. Seg., Class	USINT	0x20
		Class Number	USINT	0x04
		Log.Seg., Instance	USINT	0x24
		Instance Number	USINT	0x100
		Log.Seg., Attribute	USINT	0x30
		Attribute Number	USINT	0x03

Connection Object, Instance 3 Attributes (STROBE connection)

Attribute	Access	Name	Type	Value
1	Get	State	USINT	(1)
2	Get	Instance Type	USINT	1 = I/O Message
3	Get	Transport Class Trigger	USINT	0x83
4	Get	Production Connection	UINT	(2)
5	Get	Consumed Connection	UINT	(2)
6	Get	Initial Comm. Char.	USINT	0x1
7	Get	Production Size	UINT	See Configuration Class
8	Get	Consumed Size	UINT	See Configuration Class
9	Get/Set	Expected Packet Rate	UINT	default 2500 msec
12	Get/Set	Timeout Action	USINT	(12)
13	Get	Prod. Path Length	USINT	6
14	Get	Production Path	STRUCT of	
		Log. Seg., Class	USINT	0x20
		Class Number	USINT	0x04
		Log.Seg., Instance	USINT	0x24
		Instance Number	USINT	0x101
		Log.Seg., Attribute	USINT	0x30
		Attribute Number	USINT	0x03
15	Get	Cons. Path Length	USINT	6
16	Get	Consumed Path	STRUCT of	
		Log. Seg., Class	USINT	0x20
		Class Number	USINT	0x04
		Log.Seg., Instance	USINT	0x24
		Instance Number	USINT	0x100
		Log.Seg., Attribute	USINT	0x30
		Attribute Number	USINT	0x03

Connection Object, Instance 4 Attributes (COS/CYCLIC connection)

Attribute	Access	Name	Type	Value
1	Get	State	USINT	(1)
2	Get	Instance Type	USINT	1 = I/O Message
3	Get	Transport Class Trigger	USINT	0x83
4	Get	Production Connection	UINT	(2)
5	Get	Consumed Connection	UINT	(2)
6	Get	Initial Comm. Char.	USINT	0x1
7	Get	Production Size	UINT	See Configuration Class
8	Get	Consumed Size	UINT	See Configuration Class
9	Get/Set	Expected Packet Rate	UINT	default 2500 msec
12	Get/Set	Timeout Action	USINT	(12)
13	Get	Prod. Path Length	USINT	6
14	Get	Production Path	STRUCT of	
		Log. Seg., Class	USINT	0x20
		Class Number	USINT	0x04
		Log.Seg., Instance	USINT	0x24
		Instance Number	USINT	0x101
		Log.Seg., Attribute	USINT	0x30
		Attribute Number	USINT	0x03
15	Get	Cons. Path Length	USINT	6
16	Get	Consumed Path	STRUCT of	
		Log. Seg., Class	USINT	0x20
		Class Number	USINT	0x04
		Log.Seg., Instance	USINT	0x24
		Instance Number	USINT	0x100
		Log.Seg., Attribute	USINT	0x30
		Attribute Number	USINT	0x03

Connection Object, Instances 5-10 Attributes (UCMM or Dynamic I/O Connections)

See ODVA Specs

Connection Object Common Services

Service Code	Class	Instance	Service Name
05 (0x05)	Yes	Yes	Reset
14 (0x0E)	Yes	Yes	Get Attribute Single
16 (0x10)	No	Yes	Set Attribute Single

Connection Object Attributes

Connection Status – Attribute 1

Connection State	Interpretation
0	Non-existent
1	Configuring
3	Established
4	Timed Out

Connection ID – Attribute 4 and 5

Connection 1 Produced Connection ID: 10xxxxxx011

Connection 1 Consumed Connection ID: 10xxxxxx100

Connection 2 Produced Connection ID: 01111xxxxxx
Connection 2 Consumed Connection ID: 10xxxxxx101

xxxxxx = Node Address.

Watch Dog Timeout Action – Attribute 12

Watch Dog Timeout Action:

- 0 = Timeout (I/O Messaging default)
- 1 = Auto Delete (Explicit Messaging)
- 2 = Auto Reset
- 3 = Deferred Delete(Explicit Messaging)

Acknowledge Handler Object

Class Code: 43 (0x2D)

The Acknowledge Handler Object is used to manage the reception of message acknowledgments.

Acknowledge Handler Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
2	Get	Max Object Instance	UINT	1
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	7

Acknowledge Handler Object Instance Attributes

Attribute	Access	Name	Type	Value
1	Get/Set	Acknowledge Timer	UINT	See ODVA Specs.
2	Get/Set	Retry Limit	USINT	See ODVA Specs.
3	Get/Set	COS Producing Connection Instance	UINT	See ODVA Specs.
4	Get	Ack List Size	BYTE	See ODVA Specs.
5	Get	Ack List	BYTE, Array of UINT	See ODVA Specs.
6	Get	Data with Ack Path List Size	BYTE	See ODVA Specs.
7	Get	Data with Ack Path List	BYTE, Array of USINT,UINT	See ODVA Specs.

Acknowledge Handler Object Common Services

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Weigh Scale Object

Class Code: 100 (0x64)

The Weigh Scale Object allows the user to control and monitor the Weigh Scale Interface on the DNTLC01.

Weigh Scale Object Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
2	Get	Max Object Instance	UINT	1
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	201

Weigh Scale Object, Instance 1 Attributes

Attribute	Access	Name	Type	Value	Default
3	Get/Set	Control	WORD	(3)	0
4	Get/Set	Status	WORD	(4)	x
10	Get/Set	I/O Produce Assembly	USINT	(10)	101
11	Get/Set	I/O Consume Assembly	USINT	(11)	100
12	Get/Set	COS Produce Assembly	USINT	(12)	101
13	Get/Set	CYCLIC Produce Assembly	USINT	(13)	101
14	Get/Set	STROBE Produce Assembly	USINT	(14)	101

Weigh Scale Object Common Services

Service Code	Class	Instance	Service Name
5 (0x05)	No	Yes	Reset
14 (0x0E)	Yes	Yes	Get Attribute Single
16 (0x10)	No	Yes	Set Attribute Single

Instance Attributes Details:**(3) Control:**

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08
Tare Port4	Tare Port3	Tare Port2	Tare Port1	Zero Port4	Zero Port3	Zero Port1	Zero Port1
Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
						CHB Channel	CHA Channel

(4) Status:

Bit 15	Bit 14	Bit 13	Bit 12	Bit 11	Bit 10	Bit 09	Bit 08
Tare Port4	Tare Port3	Tare Port2	Tare Port1	Zero Port4	Zero Port3	Zero Port1	Zero Port1
Bit 07	Bit 06	Bit 05	Bit 04	Bit 03	Bit 02	Bit 01	Bit 00
Port4 Overlimit	Port3 Overlimit	Port2 Overlimit	Port1 Overlimit	CHB NO REF	CHA NO REF	CHB Channel	CHA Channel

(10) I/O Produce Assembly

Use to define the default Poll Produce Assembly

(11) I/O Consume Assembly

Use to define the default Poll Consume Assembly

(12) COS Produce Assembly

Use to define the default COS Produce Assembly

(13) CYCLIC Produce Assembly

Use to define the default Cyclic Produce Assembly

(14) Strobe Produce Assembly

Use to define the default Strobe Produce Assembly

Weigh Scale Port Object (0x65)

Class Code: 101

The Weigh Scale Port Object allows the user to monitor the weight output of the Load Cells attached to each port on the DNTLC01.

Weigh Scale Port Object Class Attributes

Attribute	Access	Name	Type	Value
1	Get	Revision	UINT	1
2	Get	Max Object Instance	UINT	4
6	Get	Max Class Identifier	UINT	7
7	Get	Max Instance Attribute	UINT	10

Weigh Scale Port Object, Instance 1..4 Attributes

Attribute	Access	Name	Type	Value	Default
3	Get/Set	Mode	USINT	(3)	0
4	Get/Set	Zero	USINT	(4)	0
5	Get/Set	Tare	USINT	(5)	0
6	Get/Set	Excitation Mode	USINT	(6)*	
7	Get/Set	Input Range	USINT	(7)	
8	Get/Set	Update Rate	USINT	(8)*	50hz
9	Get/Set	Calibration	USINT	(9)*	0
10	Get/Set	Auto Channel Multiplexing	USINT	(10)*	0
11	Get/Set	Chop	USINT	(11)*	1
12	Get/Set	Skip	USINT	(12)*	
13	Get/Set	DAC	USINT	(13)*	
14	Get/Set	Delay	USINT	(14)*	0
15	Get/Set	Fast Step	USINT	(15)*	1
20	Get/Set	Span INT16	INT	(20)@	
21	Get/Set	Full Scale INT16	UINT	(21)@	
22	Get	Gross Weight INT16	INT	(22)@	
23	Get	Tare Weight INT16	INT	(23)@	
24	Get	Net Weight INT16	INT	(24)@	
25	Get	Raw Data INT16	UINT	(25)@	
30	Get/Set	Span INT32	DINT	(30)@	
31	Get/Set	Full Scale INT32	DINT	(31)@	
32	Get	Gross Weight INT32	DINT	(32)@	
33	Get	Tare Weight INT32	DINT	(33)@	
34	Get	Net Weight INT32	DINT	(34)@	
35	Get	Raw Data INT32	UDINT	(35)@	
40	Get/Set	Span REAL32	REAL	(40)@	
41	Get/Set	Full Scale REAL32	REAL	(41)@	
42	Get	Gross Weight REAL32	REAL	(42)@	
43	Get	Tare Weight REAL32	REAL	(43)@	
44	Get	Net Weight REAL32	REAL	(44)@	
45	Get	Raw Data REAL32	REAL	(45)@	

*** Indicates Port Pair will also be set (ie when setting Instance 1, Instance 2 will also change and vice versa)**

@ Indicates that the corresponding data type will also be set. (ie. When setting the Full Scale INT16 value, the Full Scale INT32 and Full Scale REAL32 will be set to the same value).

Weigh Scale Port Common Services

Service Code	Class	Instance	Service Name
14 (0x0E)	Yes	Yes	Get_Attribute_Single
16 (0x10)	No	Yes	Set_Attribute_Single

Instance Attribute Details

(3) Mode:

Sets the Operating Mode for the Selected Port. Must be set to Calibrate (1) to perform a calibration and set to Normal (0) for normal operation.

(4) Zero:

Will zero the scale when set to 1. Must be set to Normal (0) for normal operation.

(5) Tare:

Will Tare the current weight on the selected channel when set to 1. Must be set to Normal (0) for normal operation.

(6) Excitation Mode:

When set to 0 the excitation is DC. When set to 1, the excitation is AC.

(7) Input Range:

Sets the input range for the selected channel.

Value	Range
0	-10mV to +10mV
1	-20mV to +20mV
2	-40mV to +40mV
3	-80mV to +80mV
4	0mV to +10mV
5	0mV to +20mV
6	0mV to +40mV
7	0mV to +80mV

(8) Update Rate:

Sets the update rate for the selected channel. The following ranges are supported:

CHOP	SKIP	Allowed Update Rate
0	0	150 Hz to 2048 Hz
1	0	50 Hz to 1365 Hz
0	1	150 Hz to 7600 Hz
1	1	50 Hz to 5120 Hz

(9) Calibration:

Selects the method of A/D calibration. Currently this value should be set to 8.

(10) Auto Channel Multiplexing:

When set to a 1 the module will automatically switch between its' primary and secondary channels on subsequent samples. ie. Channel A will get a sample from Port 1 and then get a sample from Port 2 then back to port 1. Channel B will alternate between Port 3 and Port 4. When set to a Zero, the user must set the active port by using the Weigh Scale Control Attribute.

(11)CHOP:

When set to 1 A/D chopping is enabled. This is the recommended method of operation as drift and noise are reduced in this mode. If faster throughputs are needed, it can be disabled by the user at the cost of the drift and noise.

(12)SKIP:

When set to 1, the A/D bypasses the FIR and uses the samples directly without any averaging. Noise is greatly increased with the SKIP enabled.

(13)DAC:

The A/D uses the DAC value to generate an offset voltage to either add to or subtract from the inputs. This can be used to electrically tare off large static scale weights allowing the whole Input Range to be used by the A/D.

(14)Delay:

The Delay attribute sets the delay between Chop edges when Chop is enabled and the A/D is using AC excitation. It can be used to negate out long switching times when using higher update rates and long cables in AC mode.

(15) Fast Step:

When set to 1, the A/D will react faster to step changes on the input. It does this by replacing the FIR filter with a moving average during step changes until the input settles, then the FIR is put back into the filtering mechanism.

(20) SPAN INT16:

Used to set the SPAN (calibration weight) when in calibration mode.

(21)Full Scale UINT16:

Used to set the full scale for the port. This value is used to determine when the scale has exceeded the max value.

(22) Gross INT16:

Used to read the gross weight value that the load cell output is representing.

(23) Tare INT16:

Used to read the tare value. It is set by using the Tare attribute or setting the corresponding tare bit in the Control Word.

(24) Net INT16:

Used to read the Net value. It is the value of the Gross value minus the Tare value.

(25) RAW UINT16:

Used to read the raw A/D value when averaging or calibrated values are not needed.

(26) SPAN INT32:

Used to set the SPAN (calibration weight) when in calibration mode.

(27)Full Scale UINT32:

Used to set the full scale for the port. This value is used to determine when the scale has exceeded the max value.

(28) Gross INT32:

Used to read the gross weight value that the load cell output is representing.

(29) Tare INT32:

Used to read the tare value. It is set by using the Tare attribute or setting the corresponding tare bit in the Control Word.

(30) Net INT32:

Used to read the Net value. It is the value of the Gross value minus the Tare value.

(31) RAW UINT32:

Used to read the raw A/D value when averaging or calibrated values are not needed.

(32) SPAN REAL32:

Used to set the SPAN (calibration weight) when in calibration mode.

(33) Full Scale REAL32:

Used to set the full scale for the port. This value is used to determine when the scale has exceeded the max value.

(34) Gross REAL32:

Used to read the gross weight value that the load cell output is representing.

(35) Tare REAL32:

Used to read the tare value. It is set by using the Tare attribute or setting the corresponding tare bit in the Control Word.

(36) Net REAL32:

Used to read the Net value. It is the value of the Gross value minus the Tare value.

(37) RAW REAL32:

Used to read the raw A/D value when averaging or calibrated values are not needed.